National Imaging Associates, Inc.*	
Clinical guidelines **MUGA (Multiple Gated Acquisition) Scan**	**Original Date: September 1997**
CPT Codes: 78472, 78473, 78494, +78496	**Last Revised Date: ~~March~~ February 2022~~1~~**
Guideline Number: NIA_CG_027	**Implementation Date: January 2023~~2~~**

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. All prior relevant imaging results, and the reason that alternative imaging cannot be performed must be included in the documentation submitted.

Indications for Multiple Gated Acquisition (MUGA) Scan[1]

~~(Doherty, 2019)~~

- To evaluate left ventricular function in a patient with coronary artery disease, valvular heart disease, myocardial disease, or congenital heart disease, in any of the following scenarios:
  - When ventricular function is required for management, and transthoracic echocardiography (TTE) or other imaging has proven inadequate[2, 3] ~~(Patel, 2013; Yancy, 2013)~~
  - When there are conflicting results between other testing (i.e., Myocardial Perfusion Imaging and TTE) in the measurement of ejection fraction (EF), and the results of the MUGA will help in the management of the patient
  - Prior TTE has demonstrated systolic dysfunction (EF < 50%) and management will change based on the results of the MUGA scan

- In the course of cardiotoxic chemotherapy when TTE images are inadequate to evaluate left ventricular systolic function[2-5] ~~(Patel, 2013; Plana, 2014; Yancy, 2013; Zamorano, 2016)~~:
  - Previous low LV ejection fraction was < 50% and receiving potentially cardiotoxic chemotherapy
  - Prior to cardiotoxic chemotherapy, and subsequently for monitoring and follow up. The frequency of testing should be left to the discretion of the ordering physician, but generally no more often than at baseline and every 6 weeks thereafter

* National Imaging Associates, Inc. (NIA) is a subsidiary of Magellan Healthcare, Inc.

BACKGROUND[2, 6-8]

~~(Friedman, 2006; Mitra, 2012; Patel, 2013; Ritchie, 1995)~~

Multiple-gated acquisition (MUGA) scanning uses ~~radio-labelled~~**radiolabeled** red blood cells to scan right and left ventricular images in a cine loop format that is synchronized with the electrocardiogram.

A prior MUGA scan is not an indication for repeat MUGA (if another modality would be suitable, i.e., TTE).

Abbreviations

EF	Ejection Fraction
MUGA	Multiple Gated Acquisition (nuclear scan of ventricular function)
TTE	Transthoracic echocardiography

POLICY HISTORY

Date	Summary
~~March~~ ~~2023~~**February 2022**~~2~~	• ~~Reference format changes~~**No significant changes**
March 2021	• Added the following statement: Previous low LV ejection fraction was < 50% and receiving potentially cardiotoxic chemotherapy
March 2020	• Added general information section as Introduction which outlines requirements for documentation of pertinent office notes by a licensed clinician, and inclusion of laboratory testing and relevant imaging results for case review • Added statement to Background that a prior MUGA scan is not an indication for repeat MUGA (if another modality would be suitable. i.e. TTE) • Removed statements from Background that CMR is recommended when TTE is inadequate and/or candidacy for cardiotoxic chemotherapy based upon LVEF is questionable and that MUGA can also be considered when CMR is not available.
July 23, 2019	• Removed chart on individual dosing for specific chemotherapeutic agents • Added indication for when there are conflicting results between other testing (i.e. MPI and TTE) in the measurement of ejection fraction, and the results of the MUGA will help in the management of the patient

	• Removed section on Radionuclide Angiography, Combination of Other Studies with MUGA, section on TTE and strain
	• Removed CAD indication
	• Added indication for cardiotoxicity as follows:
	  ○ In the course of cardiotoxic chemotherapy when TTE images are inadequate to evaluate left ventricular systolic function (Patel 2013, Plana 2014, Yancy 2013, Zamorano 2016):
	  ○ Prior to cardiotoxic chemotherapy, and subsequently for monitoring and follow up. The frequency of testing should be left to the discretion of the ordering physician, but generally no more often than at baseline and every 6 weeks thereafter
	  ○ In patients with EF < 50% on TTE receiving potentially cardiotoxic chemotherapy, more frequent monitoring (every 4 weeks) may be appropriate
	  ○ Removed section on Radionuclide Angiography, Combination of Other Studies with MUGA, section on TTE and strain

REFERENCES

~~Doherty JU, Kort S, Mehran R, et al. ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for multimodality imaging in the assessment of cardiac structure and function in nonvalvular heart disease: A Report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and the Society of Thoracic Surgeons. *J Am Coll Cardiol.* 2019; 73(4):488-516.~~

~~Fihn SD, Gardin JM, Abrams J, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS Guideline for the diagnosis and management of patients with stable ischemic heart disease: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *Circulation.* 2012; 126(25):e354-471.~~

~~Friedman JD, Berman DS, Borges-Neto S, et al. First-pass radionuclide angiography. *J Nucl Cardiol*. 2006; 13(6):e42-55.~~

~~Mitra D, Basu S. Equilibrium radionuclide angiocardiography: Its usefulness in current practice and potential future applications. *World J Radiol.* 2012; 4(10):421–430. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3495989/~~

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~~Plana JC, Galderisi M, Bara, A, et al. Expert consensus for multimodality imaging evaluation of adult patients during and after cancer therapy: A report from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *J Am Soc Echocardiogr.* 2014; 27:911-39.~~

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~~Yancy C, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA Guideline for the management of heart~~

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Reviewed / Approved by NIA Clinical Guideline Committee

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1. Doherty JU, Kort S, Mehran R, et al. ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease: A Report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and the Society of Thoracic Surgeons. *J Am Coll Cardiol*. Feb 5 2019;73(4):488-516. doi:10.1016/j.jacc.2018.10.038
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7. Mitra D, Basu S. Equilibrium radionuclide angiocardiography: Its usefulness in current practice and potential future applications. *World J Radiol*. Oct 28 2012;4(10):421-30. doi:10.4329/wjr.v4.i10.421
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ADDITIONAL RESOURCES

1. Fihn SD, Gardin JM, Abrams J, et al. 2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease: a report of the American College of Cardiology Foundation/American Heart Association task force on practice guidelines, and the American College of Physicians, American Association for Thoracic Surgery, Preventive Cardiovascular Nurses Association, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. *Circulation*. Dec 18 2012;126(25):e354-471. doi:10.1161/CIR.0b013e318277d6a0

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